

145 Cystic fibrosis airways, a particular ecological niche for bacterial species as-yet non-reported in man

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Airways of CF patients represent a particular ecological niche recognized as a remarkable model system for studies on bacterial adaptation. Recent sequence-based and cultivation-based studies of CF airway microbiota revealed the presence of multiple species not previously reported in man.

First report of 8 bacterial taxa not previously isolated in man is described herein in sputum samples of 8 CF patients. All were aerobic, gram-negative bacilli. Most of them were oxidase-positive and showed enhanced growth at 30°C. 16S rRNA gene sequencing identified *Sphingomonas pseudosanguinis*, *Aquamicrobium lusatiense*, *Phyllobacterium myrsinacearum*, *Shinella* sp., *Acetobacter fabarum*, *Advenella kashmirensis*, *Chryseobacterium bovis* and *Pseudomonas brenneri*. These bacteria have been described either in cow's milk or in various environments: water, plants and soil. *A. fabarum* increased the list of acetic acid bacteria – recently recognized as emerging opportunistic human pathogens – recovered from human samples.

Their impact on the airway microbiota and on the clinical evolution has still to be determined. Some species might specifically colonize the CF respiratory tract in relation to particular metabolic traits, like growth in acidic conditions for *Acetobacter* and *Advenella*. The role of this colonization on the global resistance of the microbiota to antimicrobial agents should be evaluated since most of environmental opportunistic pathogens found in human are known to display high level of resistance.

146 Chronic *Aspergillus fumigatus* colonisation of the cystic fibrosis airway is common and may be associated with a more rapid decline in lung function

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Objectives: (1) To study the rate of *Aspergillus fumigatus* (*Af*) airway colonisation in a tertiary paediatric CF cohort. (2) To evaluate the sensitivity of routine clinical sampling at detecting *Af*. (3) To compare lung function of *Af*-colonised and non-colonised children.

Methods: 8-year retrospective cohort analysis (Sep 2002–Aug 2010). Patient clinical and microbiological data were extracted from our local database and case notes.

Results: 2703 respiratory specimens from 51 children were available. 19 (37%) had a positive *Af* culture at least once during the 8-year period, with 10 (20%) children persistently colonised (defined as at least two positive *Af* cultures in any one-year period: Amin *et al.*, 2010). The median age at first *Af*-positive culture was 9.0 years (range 3.1–15.6). In 15 of the 19 children (79%), *Pseudomonas* was isolated at least once. Of 48 broncho-alveolar lavage (BAL) specimens, 29% tested positive for *Af*, compared with 14% of 976 sputum samples and 0.8% of 1679 cough swabs. Within a 3-month period of any *Af*-positive BAL sample, *Af* was cultured from only 19.5% of 41 sputum samples and 2.7% of 37 cough swabs. Of 7 children in our cohort classed as having 'severe' lung disease (Schluchter *et al.*, 2006), 4 were chronically colonised with *Af*, only one of whom met diagnostic criteria for ABPA.

Conclusion: Chronic *Af* colonisation of the CF airway is common, and may be associated with worse lung function. In our practice, BAL appears superior at detecting lower airway *Af* compared to sputum samples and cough swabs.

Reference(s)

Amin 2010. Chest 137: 171–176.

Schluchter 2006 Am J Resp Crit Care Med 174: 780–78.

147 Utility of Thymus and Activation Regulated Chemokine (TARC) in serodiagnosis of ABPA in a paediatric cystic fibrosis population

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Diagnosis of ABPA is often difficult in CF patients as the clinical symptoms associated mimic those of exacerbations. The Cystic Fibrosis Foundation proposed the following diagnostic criteria for ABPA: Respiratory deterioration not attributable to another cause, serum IgE higher than 500 IU/ml, positive skin test to *A. fumigatus* or serum specific IgE, and one or both of the following: specific serum precipitins or IgG, and new or recent chest imaging abnormalities. Recently, TARC (Thymus and Activation Regulated Chemokine) has been proposed for diagnosis in this patient group. This study aims to examine TARC and determine the correlation between pre-existing makers, to evaluate the utility of this as an improved diagnostic assay. Forty serum samples submitted by CF clinicians between March and July 2010 were examined. Patients had a clinical suspicion of ABPA; however, there were no guidelines to initiate sampling. All standard markers IgG, specific and total IgE were tested in the routine diagnostic lab, and the TARC assay was performed using a commercially available ELISA. Patients had an average age of 9 years (range 2–14) and 48% were female. Statistical analysis of the data showed no correlation between standard and the new TARC assay: TARC vs IgG ($p=0.491$), TARC vs specific IgE ($p=0.869$), TARC vs total IgE ($p=0.264$). Implementing a lab based TARC assay without detailed clinical protocols including sampling at known time points during an established illness does not add to the serological diagnosis of ABPA. This does not preclude a potential utility for this assay however further analysis of TARC correlated with clinical diagnostic criteria is required.

148 The influence of moulds as an independent risk factor for decreasing lung function in cystic fibrosis

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The role of moulds in CF patients is complicated and positive cultures can often be disregarded as contaminants when there is a lack of significant clinical deterioration. In this study we examined patient lung function relative to pathogens isolated from their respiratory specimens. Patients were categorised into 4 groups depending on the organisms isolated from sputum over an 16 month period the groups included patients where no pathogens were isolated (Negative); where a pseudomonad (Pa) had been isolated; where a mould had been isolated and where both a Pa and mould have been isolated. Statistical analysis was performed using a two-tailed t-test. There were no significant differences in any of the demographic data in each group this included (age, sex, BMI, DEPCAT score). These result show that there was a significant difference between the negative patients and those where Pa had been isolated ($p=0.0042$) however there was no significant difference between negative patients and patient where mould was isolated ($p=0.1955$) When analysing the patients were moulds were isolated in conjunction with Pa there was a trend toward more pronounced lung decline ($p=0.0022$) suggesting that there is a cumulative effect where a greater decline in lung function (% predicted FEV) was noted in the patients with both pathogens. In conclusion greater emphasis has to be placed on moulds isolated from specimens in CF patients to prevent accelerated lung function decline in this patient group. This study audited samples over sixteen months and it would be beneficial to extend this to determine if this trend becomes more pronounced the longer patients are co-colonised with both moulds and Pa.